



# Winter-time Demands for Oil Spill Response Development in the Baltic Sea Environment

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- Main Features of the Baltic Sea
- Development Trends
- Traffic Statistics
- Winter Problems
- Risks related to Winter Navigation
- HELCOM
- Risk Control Options (RCOs)
- Conclusions

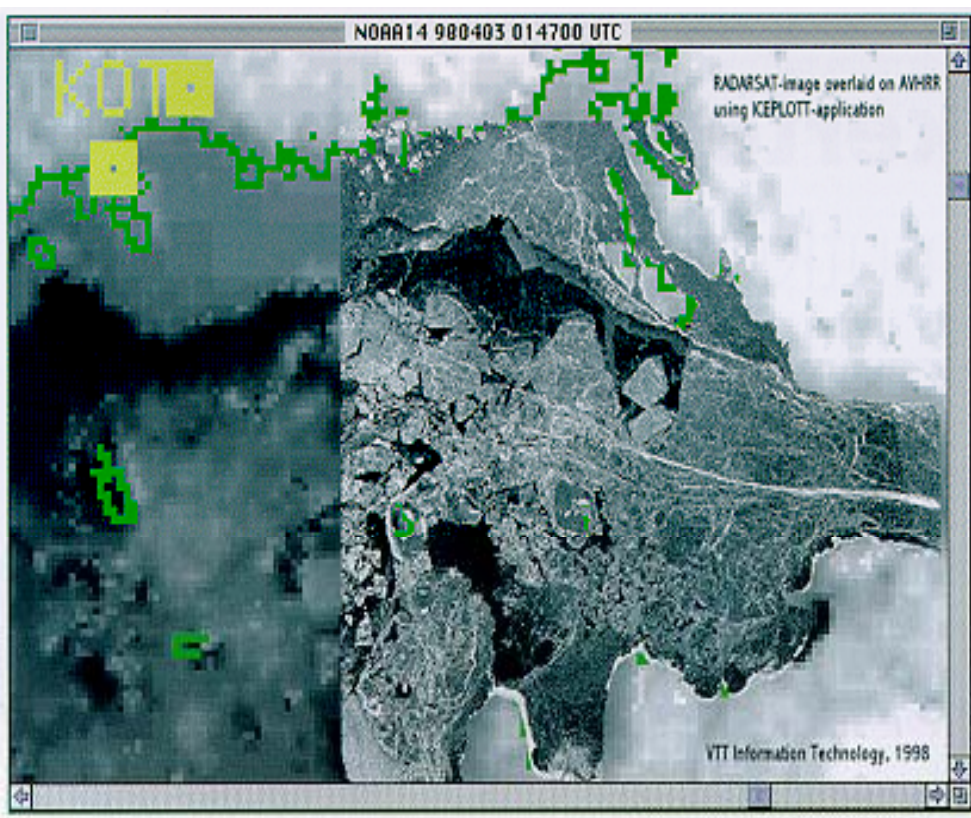
## Baltic Sea in Brief

- The current surface area of the Baltic Sea (Figure 2) is approx. 420,000 km<sup>2</sup>, its volume is 21,000 km<sup>3</sup>.
- The extent of its catchment area exceeds 1,700,000 km<sup>2</sup>. Therefore, the catchment area is approximately five times as large as the surface area itself.
- The average depth of the Baltic Sea is just 55 m, compared to other landlocked seas such as the Mediterranean whose average depth is 1,000 m. The greatest depth of the Baltic Sea is only 450 m.
- A total of nine countries border the sea: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden.





# Winter Problems



# Development Trends

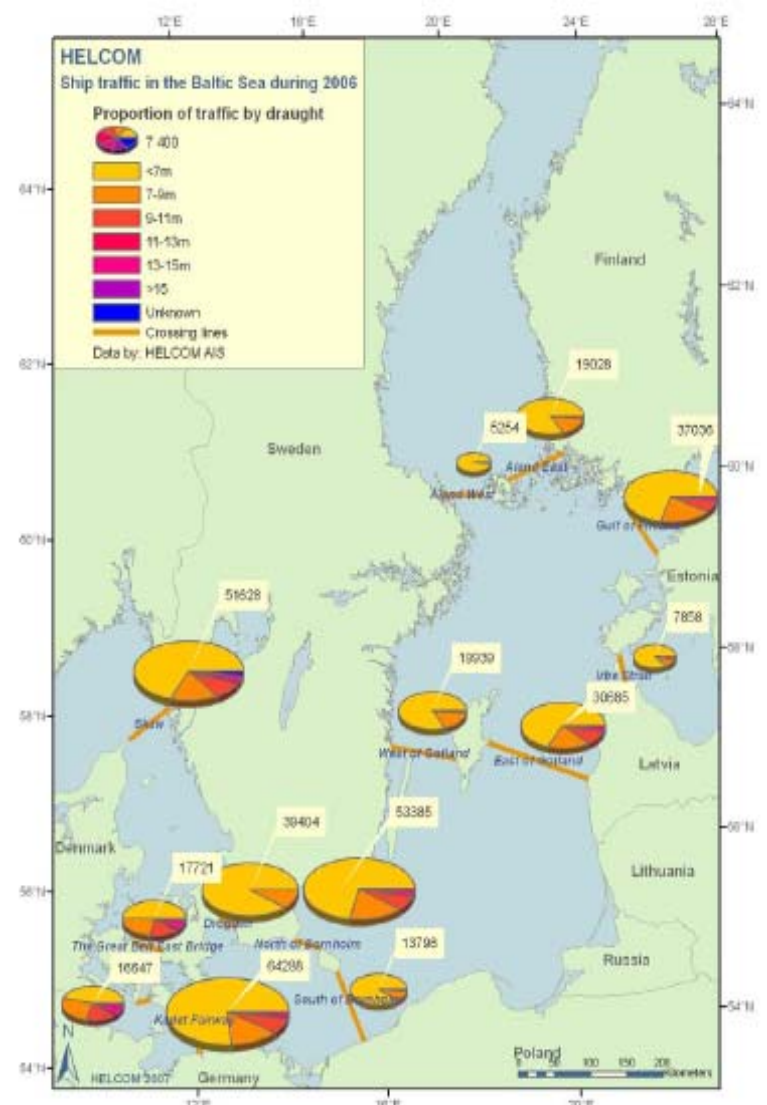
Maritime Traffic is increasing in the Baltic Sea,

Oil Transportations will grow significantly especially in the Gulf of Finland area,

New Risk Control Options are scheduled in the near future,

Recent statistics shows increased risks for collisions and groundings in the Baltic Sea (Helcom statistics)

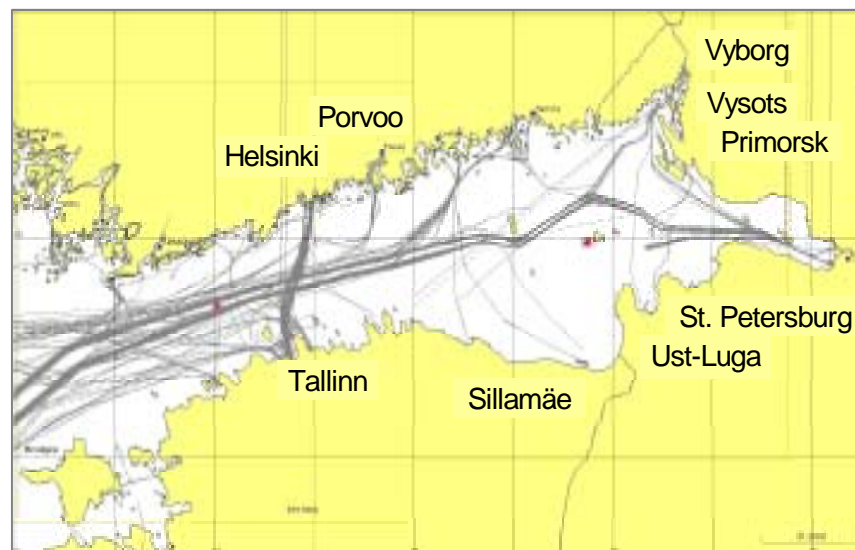
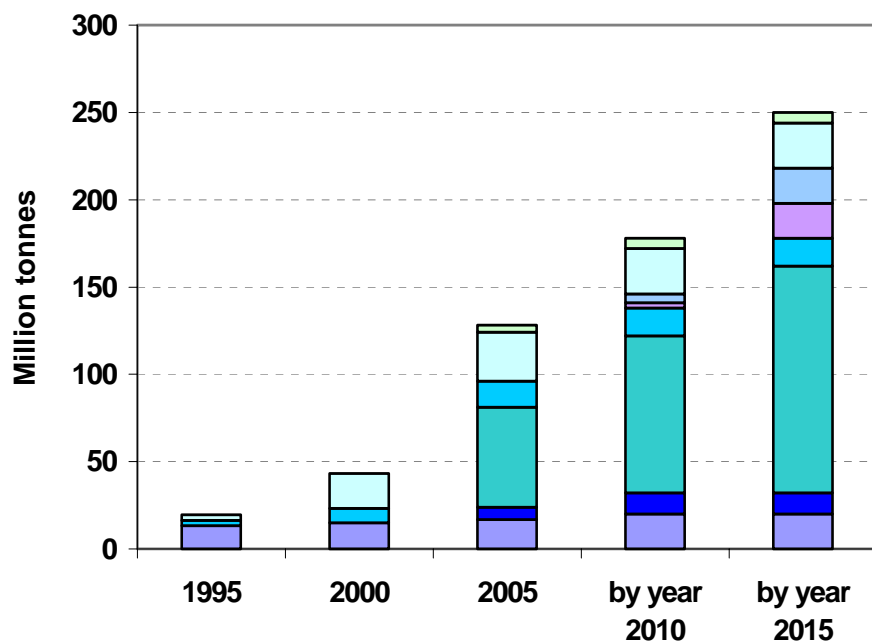
Winter Navigation may encounter problems in severe winters.





## OIL TRANSPORTATION IN THE GULF OF FINLAND THROUGH MAIN OIL PORTS

Oil transportation in years 1995-2005 and estimated development by year 2015



Porvoo
  Vysotsk
  Primorsk
  St. Petersburg
  Ust-Luga
  Sillamäe
  Tallinn
  Others (smaller oil ports)\*

## Chemical Transport in the Baltic



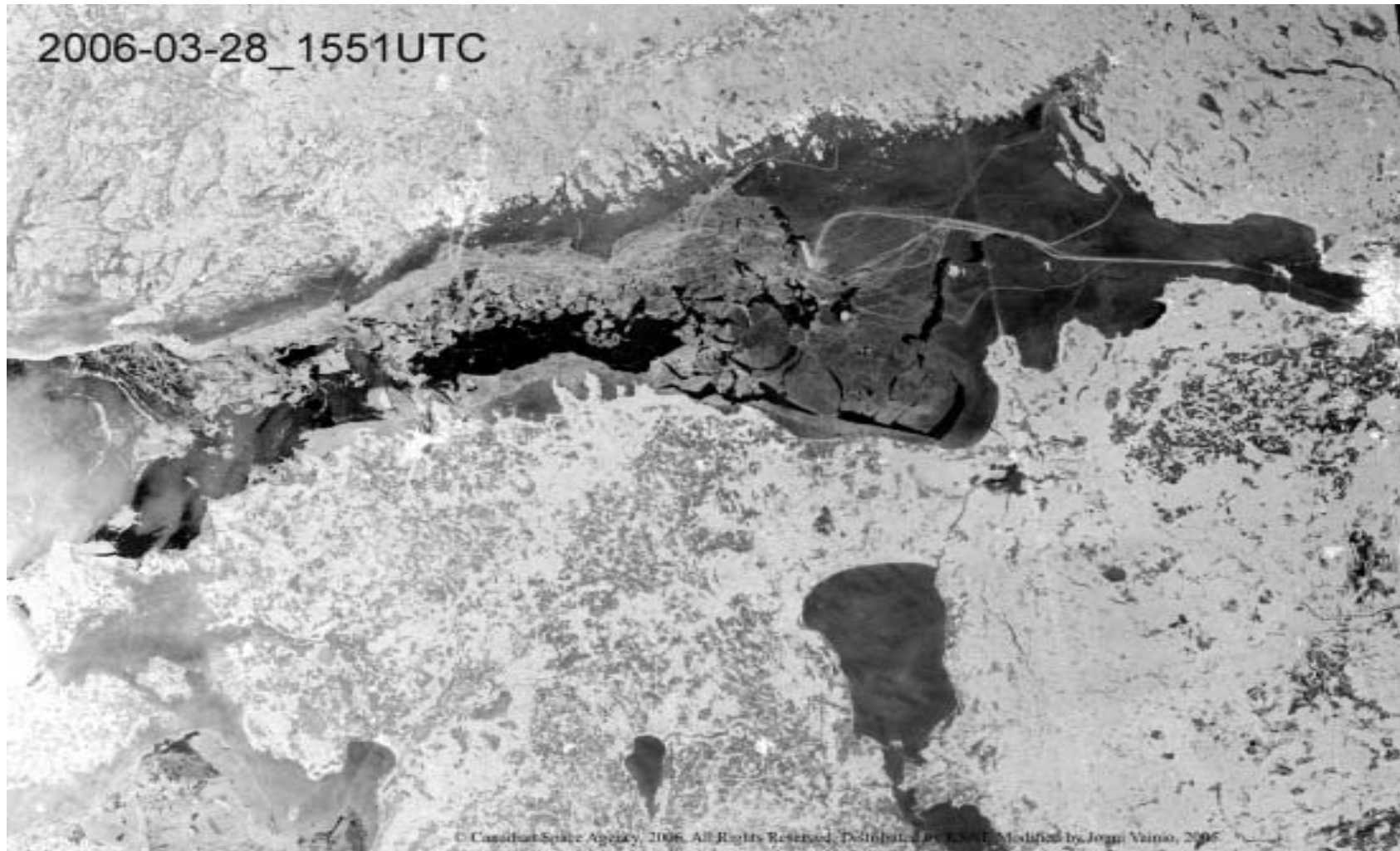


## Transportation Statistics - Chemical Bulk



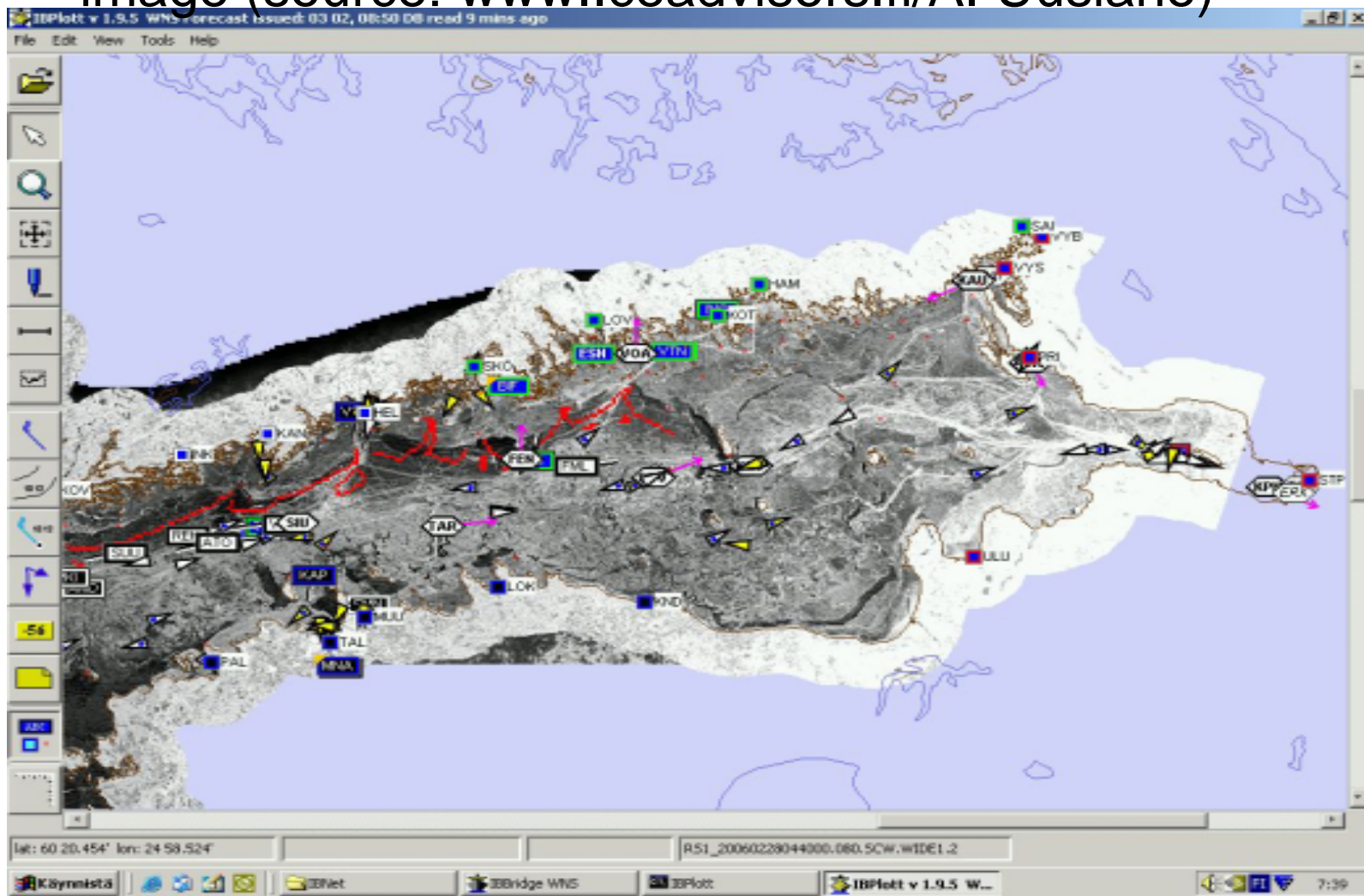
- Inquiry to 55 ports
- Statistics
- Reports and webb pages
- Totally 46 ports data
- Liquid Bulk
- Based on the data received, liquid bulk chemical transport in the Baltic Sea was around 9.1 million tons in 2004 compared to the 5,8 million tons in 1987.
- Sources and data are published by VTT ( VTT Publications 595).

Ice conditions in the GoF based on the satellite image (source: [www.Iceadvisors.fi/A](http://www.Iceadvisors.fi/A). Uusiaho)





Ice conditions in the GoF based on the satellite image (source: [www.Iceadvisors.fi/A](http://www.Iceadvisors.fi/A). Uusiaho)







## Prioritised list of hazards related to winter navigation in GoF

- 1 Heavily increasing tanker traffic
- 2 Increasing traffic volumes between Helsinki and Tallinn
- 3 Single bottom tankers
- 4 Rescue operations in heavy ice conditions
- 5 Vessels unable to give way according to regulations because of heavy ice conditions
- 6 Oil combating measures in ice conditions
- 7 Crews which are unfamiliar with ice conditions or inexperienced in winter navigation
- 8 Lack of escort towing
- 9 Getting stuck in compressive ice
- 10 Occasional disruptions in icebreaker activities
- 11 Problems in radio communication
- 12 Navigation errors, which happen when trying to avoid difficult ice conditions
- 13 Lack of routing system in ice conditions
- 14 Cold weather, rapidly changing ice conditions
- 15 Icing

Accident and incident types ([www.iceadvisors.fi](http://www.iceadvisors.fi) )

Accident/incident type	Typical ice related situation
Hull ice damage	<ul style="list-style-type: none"><li>•Ship moves at moderate or high speed and hits fast ice, an ice floe or ridge</li><li>•Ice is compressing against the side of the ship hull</li></ul>
Rudder damages	<ul style="list-style-type: none"><li>•Ice load directed to rudder (when moving astern)</li><li>•E.g. ramming operations in difficult ice conditions with repetitive back and forth movements</li></ul>
Propeller damages	<ul style="list-style-type: none"><li>•Ship with stopped or slowly rotating propeller is moving through ice</li><li>•Ramming operations in difficult ice conditions with repetitive back and forth movements</li></ul>
Fire or explosion, machinery damage etc.	

Accident and incident types ([www.iceadvisors.fi](http://www.iceadvisors.fi) )

Accident/incident type	Typical ice related situation
Collision	<ul style="list-style-type: none"><li>•In icebreaker assistance</li><li>•Between unassisted vessels in narrow ice channel</li></ul>
Drift groundings	<ul style="list-style-type: none"><li>•Vessel gets stuck in ice and drifts with the ice on a shoal</li></ul>
Powered grounding	<ul style="list-style-type: none"><li>•Ice prevents from making needed manoeuvre to keep ship on safe route</li><li>•Vessel is seeking for an easier route in difficult ice conditions and thus deviates from the normal route</li></ul>
Icing	<ul style="list-style-type: none"><li>•Cold and windy <u>open sea</u> conditions</li></ul>



## Risks of winter navigation in the northern Baltic Sea (Jalonen et al, 2005)

<b>Winter classification</b>	<b>Fatalities</b>	<b>Pollution</b>	<b>Total loss</b>
<b>mild winter</b>	<b>once in 40–75 years</b>	<b>once in 8–17 years</b>	<b>once in 12–20 years</b>
<b>normal winter</b>	<b>once in 10–20 years</b>	<b>once in 2–5 years</b>	<b>once in 2–5 years</b>
<b>severe winter</b>	<b>once in 3–6 years</b>	<b>yearly</b>	<b>once in 1–2 years</b>

# Helcom



## STRUCTURE OF HELCOM





# HELCOM RESPONSE GROUP

- **HELCOM RESPONSE** at work
- The Group works:
  - to ensure swift national and international response to maritime pollution incidents
  - to ensure that **in case of an accident** the right equipment is available and routines are in place to respond immediately in co-operation with neighbouring states
  - to analyse **developments in maritime transportation** around the Baltic and investigate possible impacts on international cooperation with regard to pollution response
  - to coordinate **the aerial surveillance** of maritime shipping routes to provide a complete picture of sea-based pollution around the Baltic, and to help **identify suspected polluters**





# HELCOM MARITIME GROUP

- **The Maritime Group of the Helsinki Commission (HELCOM MARITIME)** works **to prevent any pollution from ships** – including deliberate operational discharges as well as accidental pollution.
- Shipping is an international business that needs international regulations. All ships sailing the Baltic have to comply with the strict global and regional regulations, regardless of whatever flag they are sailing under.
- HELCOM MARITIME organises regular meetings involving representatives from inter-governmental organisations, non-governmental organisations, maritime transportation authorities and pollution incident response organisations.
- HELCOM MARITIME works closely together with other international bodies such as the [International Maritime Organization](#) (IMO) to ensure that international measures are properly applied and implemented in the Baltic.

## MT Baltic Carrier Accident in 2001 and HELCOM's Extraordinary Ministerial Meeting

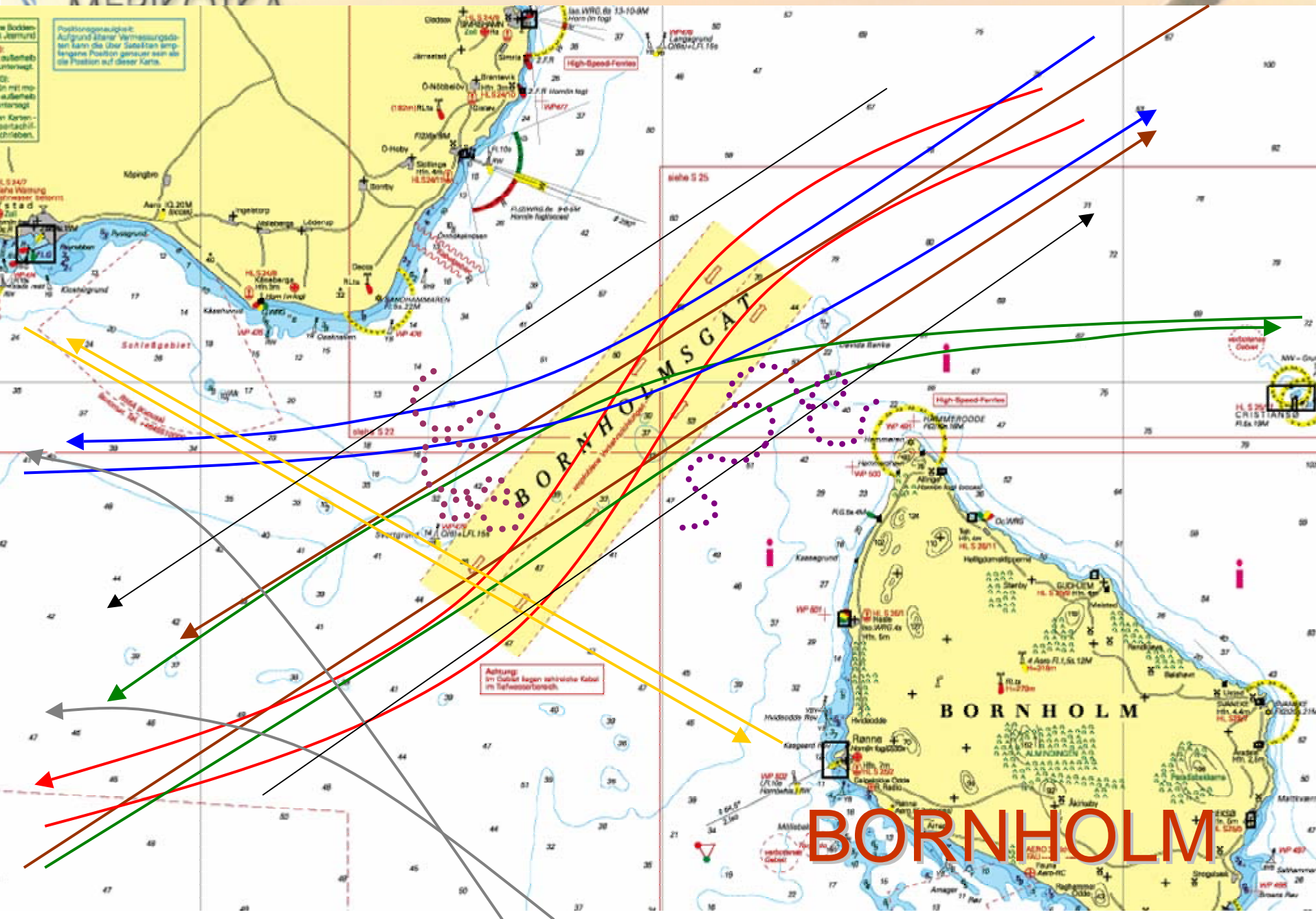
- ICE EWG
- PILOT EWG
- AIS EWG
- ROUTEING EWG
- SURVEYING EWG



# Pilot Expert Working Group / High Risk Areas

- **1 Gulf of Finland**
- **2. The Northern Quark**
- **3. The Southern Quark**
- **4. The Strait of Irbe  
(Latvia's contribution)**
- **5. The area between  
Bornholm and Sweden**
- **6. The area between the  
Sound, the Katetrende**
- **7. The Baltic Sea from a  
line N-S at 11o57,5' E to  
a line N-S at 12o 44'E**
- **8. The Baltic Sea W of a  
line N-S at 11o 57,5'E**
- **9. The Sound, the Belts  
and Kattegat S**
- **10. Kattegat N of a line  
between Sjaellands Rev  
and Fornaes.**









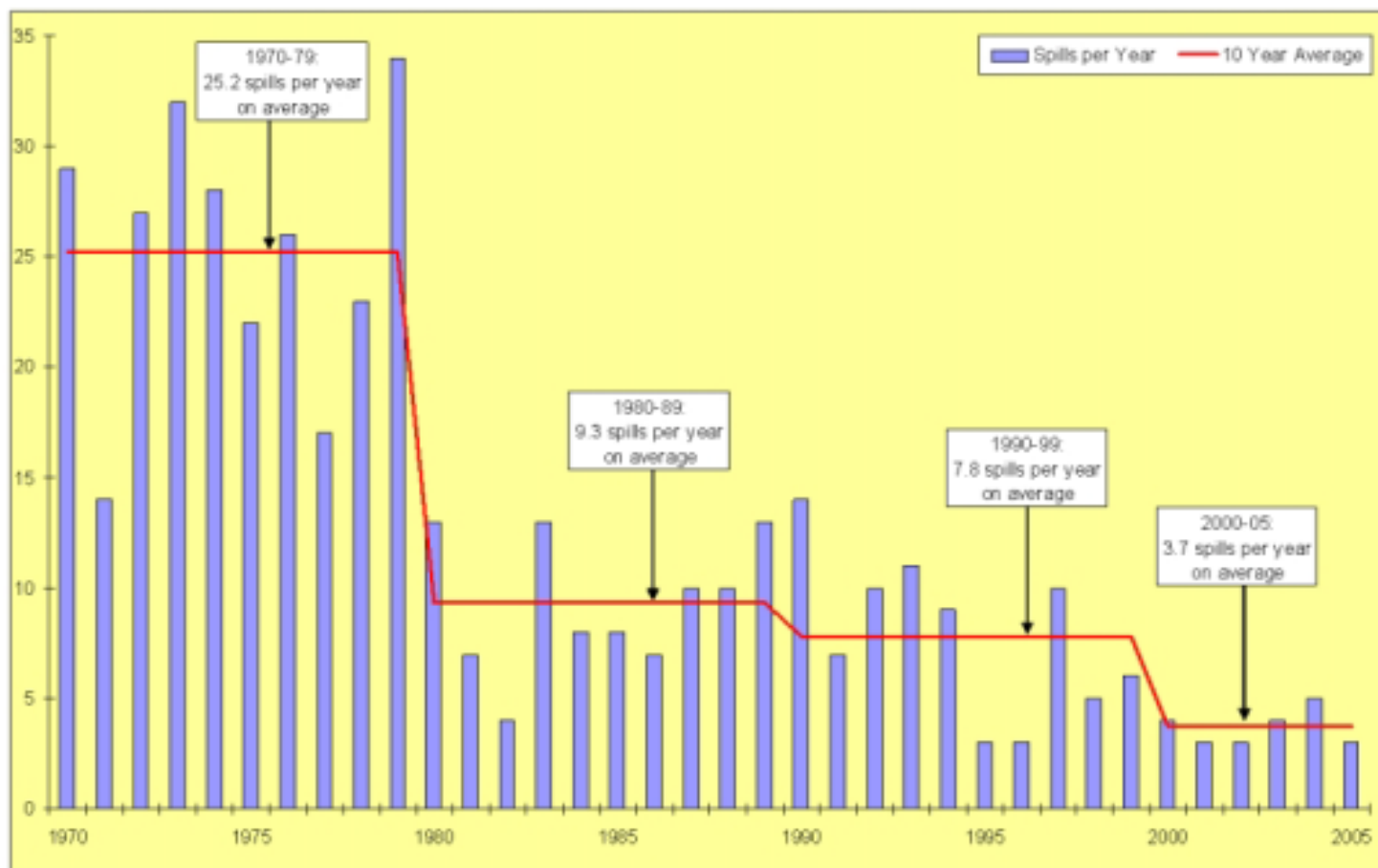
## Fu Shan Hai, 2003





# Risk Control Options will Reduce the Risks of Accidents

Figure: Number of Oil Spills over 700 tonnes, ITOPF

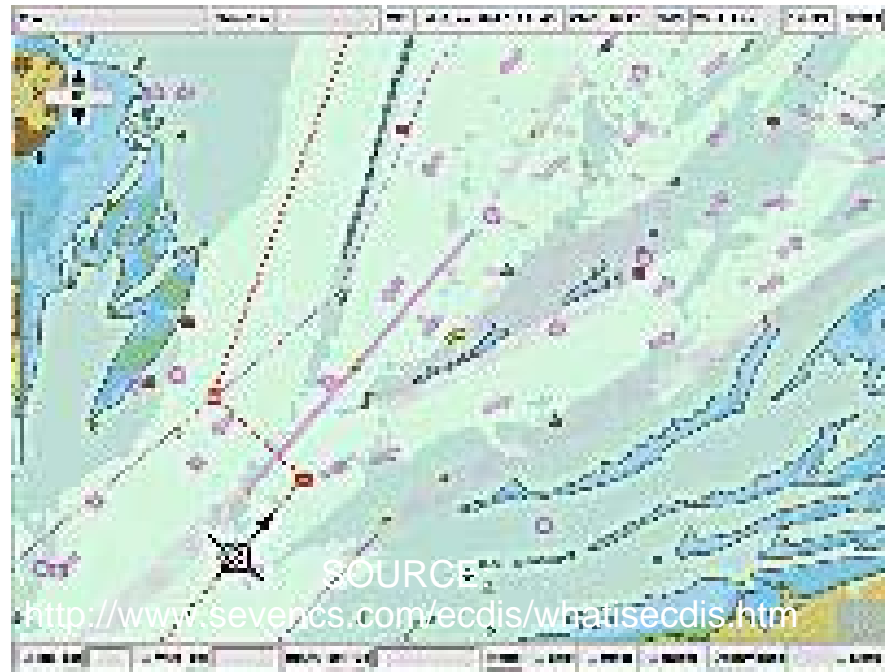


# Risk Control Options

Automatic Identification System (AIS) is a system that makes it possible to monitor ships from other ships, and from shore based stations. AIS equipped ships continuously transmit a short message containing information of position, course over ground (COG), speed over ground (SOG), gyro course (heading), etc. Ships equipped with AIS meeting anywhere on earth will be able to identify and track each other without being dependent of shore stations.

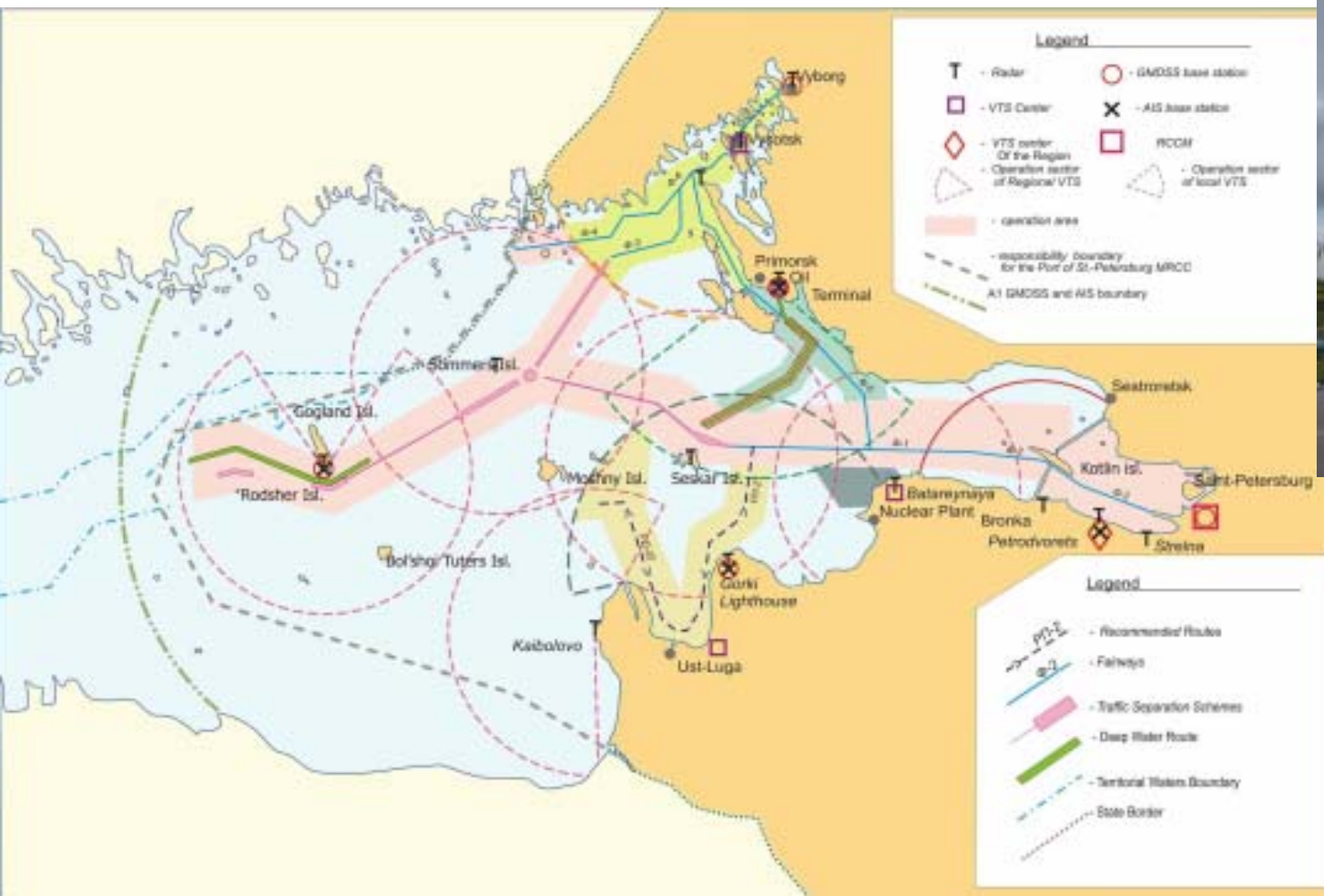
## Electronic Chart Display and Information System

**An ECDIS is not only an adequate replacement for the paper nautical chart but also a system containing all information important for navigation that can be called up at any time and without delay. Today, this information is still scattered about in various publications, and manual search procedures are laborious and time consuming. ECDIS also offers the possibility of automatic antigrounding alarm, which is not possible with any other navigation aid.**

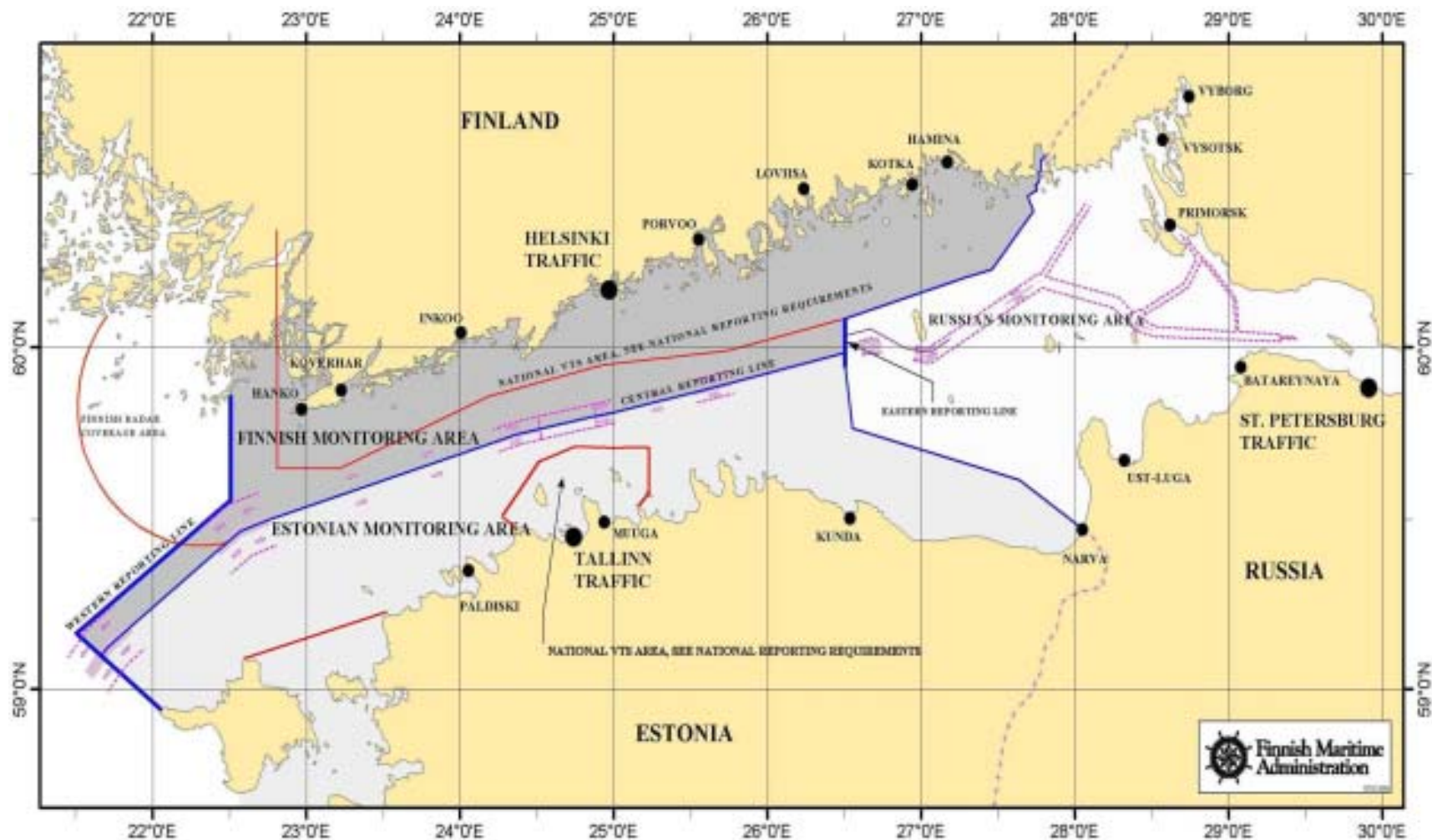




# Risk Control Options - VTS



## GOFREP system, since 1 July 2004



## RCO's - Conclusions

Risk estimations based on statistical analyses may give false results, if the statistics is not reliable enough (too narrow, not harmonized), however Global FSA is required

Numerical simulations may include restrictions and simplifications

AIS gives real-time accurate information for the Risk Analyses

The use of RCO's in the future will reduce the risk levels significantly

Winter navigation - GOF

More attention should be paid to human-machine interaction. **WHY ?**



Focus to the preventory measures, but do not forget to be prepared



Spring 2007 – double hull modern tanker grounded with over 100 000 tn of crude in spite of all RCOs



## More Information

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